



DATA STRUCTURES LAB ASSIGNMENT

Submitted by: M. Rehan Asghar

ROLL NO: BSSE 15126



Lab Task I:

Write a program that uses stack to convert base 10 representation of a positive integer to base 2

Source Code:

```
#include <iostream>
#include <conio.h>
using namespace std;
void pop();
void push(int);
int top=0;
int stack[50];
int main()
{
    int i;
    int r;
    cout<<"Input Decimal Positive Number: ";
    cin>>i;
    while(i>=1)
    {
        r=i%2;
        i /= 2;
        push(r);
    }
    while (top != 0)
    {
        pop();
    }
    cout << endl;
    return 0 ;
}
void push(int x)
{
    top++;
    stack[top]=x;
}
void pop(void)
{
    cout<< stack[top];
    top--;
}
```

Lab Task II:

Write a program that generates a random sequence of digits. Display them to user one at a time and then ask the user to reproduce the sequence. Use a queue to store the sequence of digits.

Source Code:

```
#include <iostream>
#include <conio.h>
#include <cstdlib>
#include <ctime>
using namespace std ;
int rear = -1 ;
int top = 0;
int que [50];
void enqueue () ;
void dequeue () ;
void display () ;
void exit () ;
int main ()
{
    int random_numbers[10];
    srand((unsigned)time(NULL));
    cout<<"These are the Random
Sequence of numbers"<<endl;
    for(int i=0;i < 10; i++)
    {
        random_numbers[i] = 1+ rand() % 10;
        cout << random_numbers[i] <<",";
    }
    cout<<"Choose 1 by 1 to add in
Queue"<<endl;
    int ch ;
    while ( ch != 4 )
    {
        cout << "\n\n Enter your Choice " << endl ;
        cout << " 1. Enque \n 2. Deque \n 3. Display
\n 4. Exit " << endl ;
        cin >> ch ;
        switch ( ch )
        {
            case 1 : enqueue () ;
                break ;
            case 2 : dequeue () ;
                break ;
            case 3 : display () ;
                break ;
            case 4 : exit () ;
                break ;
        }
    }
    return 0 ;
}

void enqueue ()
{
    if ( rear == 9 )
    {
        cout << "\n Queue is Full !!! " << endl ;
        return ;
    }
    else
    {
```

```
int nmbr ;                                cout << que[i] << endl ;
cout << "\n Enter the number " ;          }
cin >> nmbr ;                              }
que [++rear] = nmbr ;                      }
cout << "\n Number " << nmbr << " has been  void exit ( )
added " << endl ;                          {
}                                           }
}                                           return ;
void deque ( )                              }
{
if ( top == rear )
{
cout << "\n Queue is already empty " ;
}
else
{
top++;
cout << "\n Element is Removed " ;
}
}
void display ( )
{
if ( rear < 0 )
{
cout << "\n Queue is empty " ;
}
else
{
cout << "\n Queue has elements " << endl ;
for ( int i = top ; i <= rear ; i++ )
{
```